

FIGURE 1

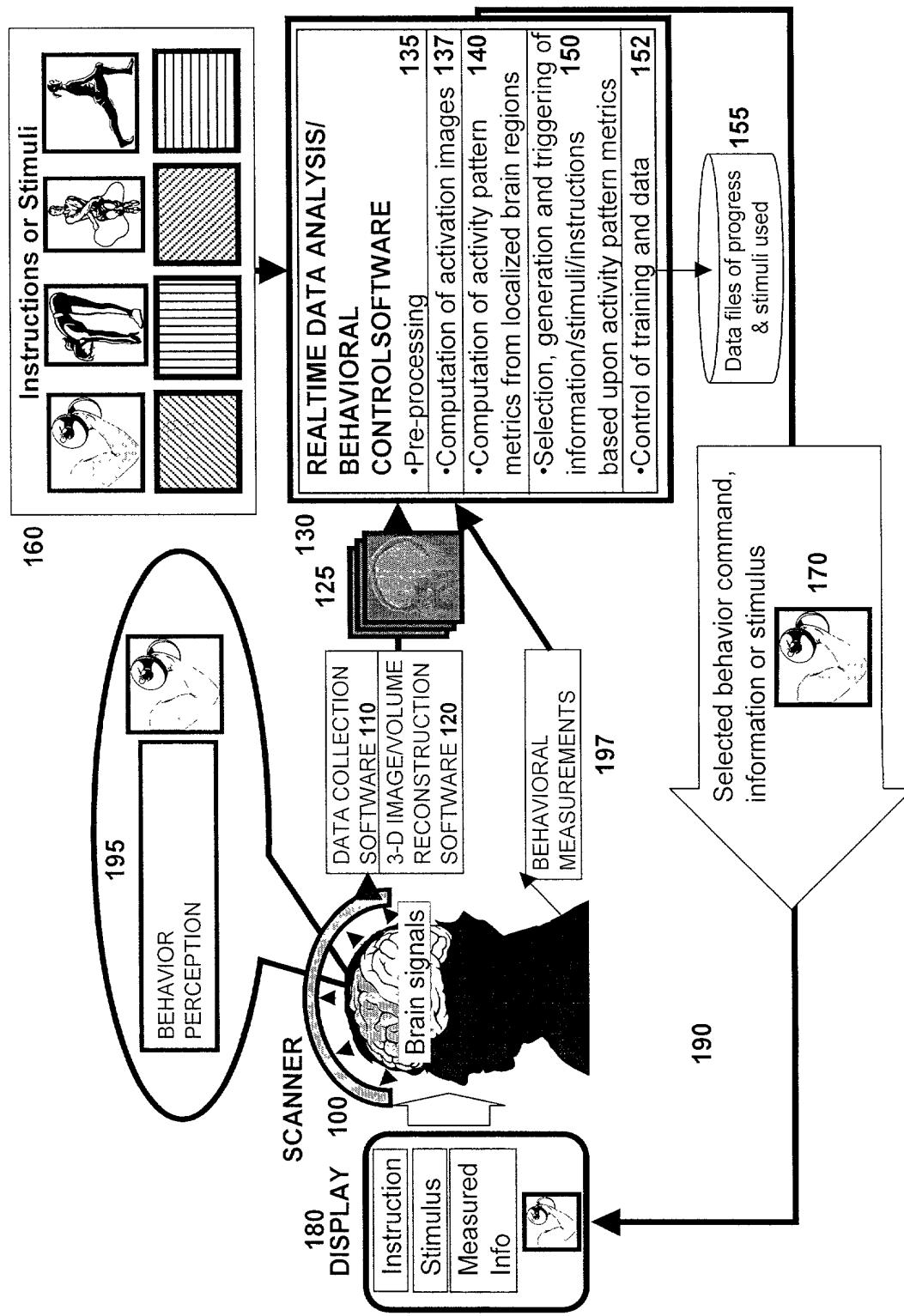


FIGURE 2

| | |
|---|---|
| FOREBRAIN | Parietal lobe |
| Diencephalon | Frontal lobe |
| Subthalamus | Cerebral white matter |
| Zona incerta | Anterior commissure |
| Subthalamic nucleus | Internal capsule |
| Hypothalamus | Corpus callosum |
| Intermediate hypothalamic region | Basal ganglia |
| Hypophysis | Amygdala |
| Adenohypophysis | Globus pallidus |
| Neurohypophysis | Striatum |
| Thalamus (including all subdivisions) | Substantia Nigra (pars compacta and pars reticulata) |
| Metathalamus | Caudate nucleus |
| Medial geniculate body | Putamen |
| Lateral geniculate body | Septum |
| Epithalamus | Fornix |
| Habenula | Olfactory bulb |
| Pineal body | MIDBRAIN |
| Telencephalon | Cerebral Peduncle |
| Cerebral cortex including all 47 areas as described by Brodmann | Substantia nigra |
| Archicortex | Midbrain tegmentum |
| Hippocampal formation | Midbrain reticular formation |
| Hippocampus | Red nucleus |
| Dentate gyrus | Oculomotor nuclei |
| Subiculum | Tectum |
| Parahippocampal gyrus | Inferior colliculus |
| Cingulate gyrus | Superior colliculus |
| Occipital lobe | Pretectal region |
| Temporal lobe | HINDBRAIN |
| Insula | Medulla oblongata |
| | A more complete list is available in cited neuroanatomical texts. |

FIGURE 3

| | | | |
|--|--------------------------------|--------------------------------------|-----------------------------|
| Alzheimer's Disease | Chronic Pain | Lateral Medullary Syndrome | Obesity |
| Amyotrophic Lateral Sclerosis | Chronic Regional Pain Syndrome | Occipital Neuralgia | Occipital Neuralgia |
| Anxiety Disorders | Cns Trauma | Overuse Syndrome | Overuse Syndrome |
| Aphasia | Cushing's Syndrome | Leigh's Disease | Pain - Chronic |
| Apraxia | Dandy-Walker Syndrome | Lewy Body Dementia | Paresthesia |
| Asperger Syndrome | Locked-In Syndrome | Locked-In Syndrome | Parkinson's Disease |
| Attention Deficit-Hyperactivity Disorder | Dementia - Multi-Infarct | Lou Gehrig's Disease | Parkyotonia |
| Autism | Dementia With Lewy Bodies | Lupus - Neurological Sequelae | Congenita |
| Autonomic Dysfunction | Depression | Lyme Disease - Neurological Sequelae | Parry Romberg |
| Back Pain | Diabetic Neuropathy | Meningitis | Peripheral Neuropathy |
| Bell's Palsy | Diffuse Sclerosis | Migraine | Pervasive |
| Bipolar Disorder | Dysgraphia | Mini-Stroke | Developmental Disorders |
| Brain and Spinal Tumors | Dyslexia | Motor Neuron | Pick's Disease |
| Brain Aneurysm | Dystonias | Diseases | Pinched Nerve |
| Brain Injury | Encephalitis and Meningitis | Multiple Sclerosis | Pituitary Tumors |
| Carpal Tunnel Syndrome | Epilepsy | Muscular Dystrophy (MD) | Postherpetic Neuralgia |
| Causalgia | Friedreich's Ataxia | Myasthenia Gravis | Repetitive Motion Disorders |
| Central Pain Syndrome | Gaucher's Disease | Myoclonus | Repetitive Stress Injuries |
| Cerebral Aneurysm | Guillain-Barre Syndrome | Myopathy | Restless Legs Syndrome |
| Cerebral Arteriosclerosis | Head Injury | Myotonia Congenita | Rett Syndrome |
| Cerebral Palsy | Headache | Narcolepsy | Schizophrenia |
| Charcot-Marie-Tooth Disorder | Herpes Zoster | Neurofibromatosis | Seizure Disorder |
| Chiari Malformation | Huntington's Disease | Neurological Manifestations of AIDS | Shingles |
| Chorea | Hydrocephalus | Neuronal Migration Disorders | Sleep Apnea |
| | Landau-Kleffner Syndrome | Landau-Kleffner Syndrome | Sleep Disorders |
| | | Niemann-Pick Disease | Spasticity |
| | | | Spina Bifida |

FIGURE 4

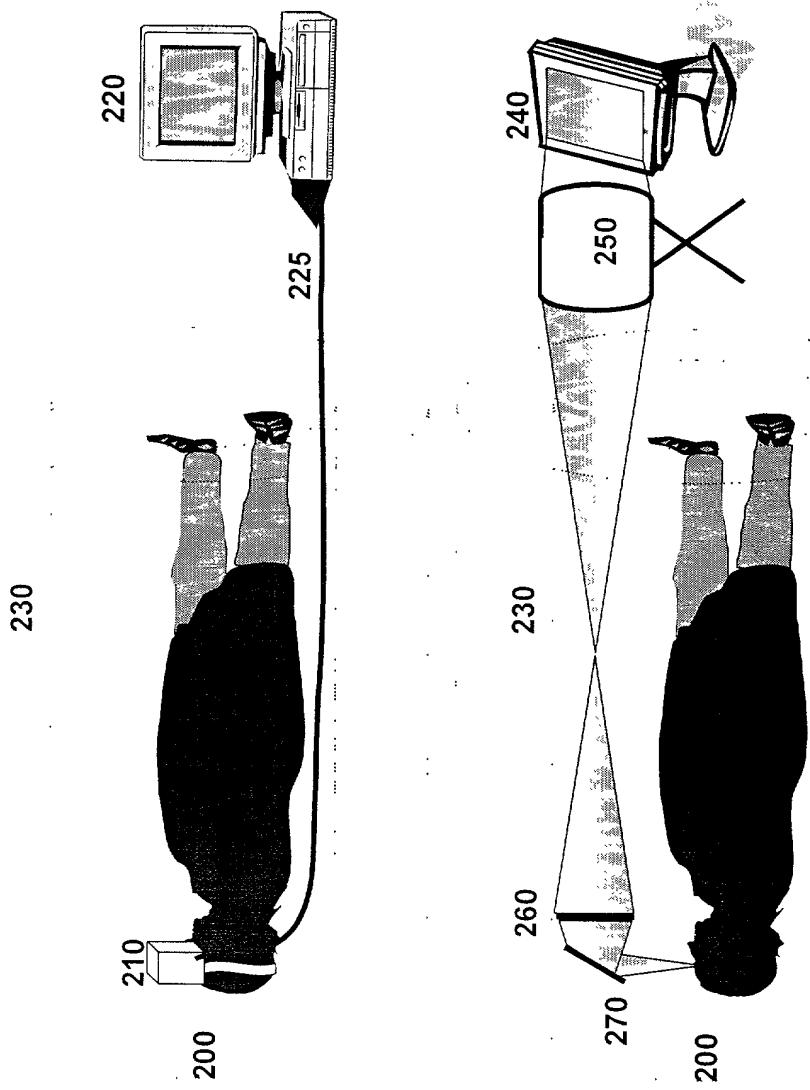


FIGURE 5

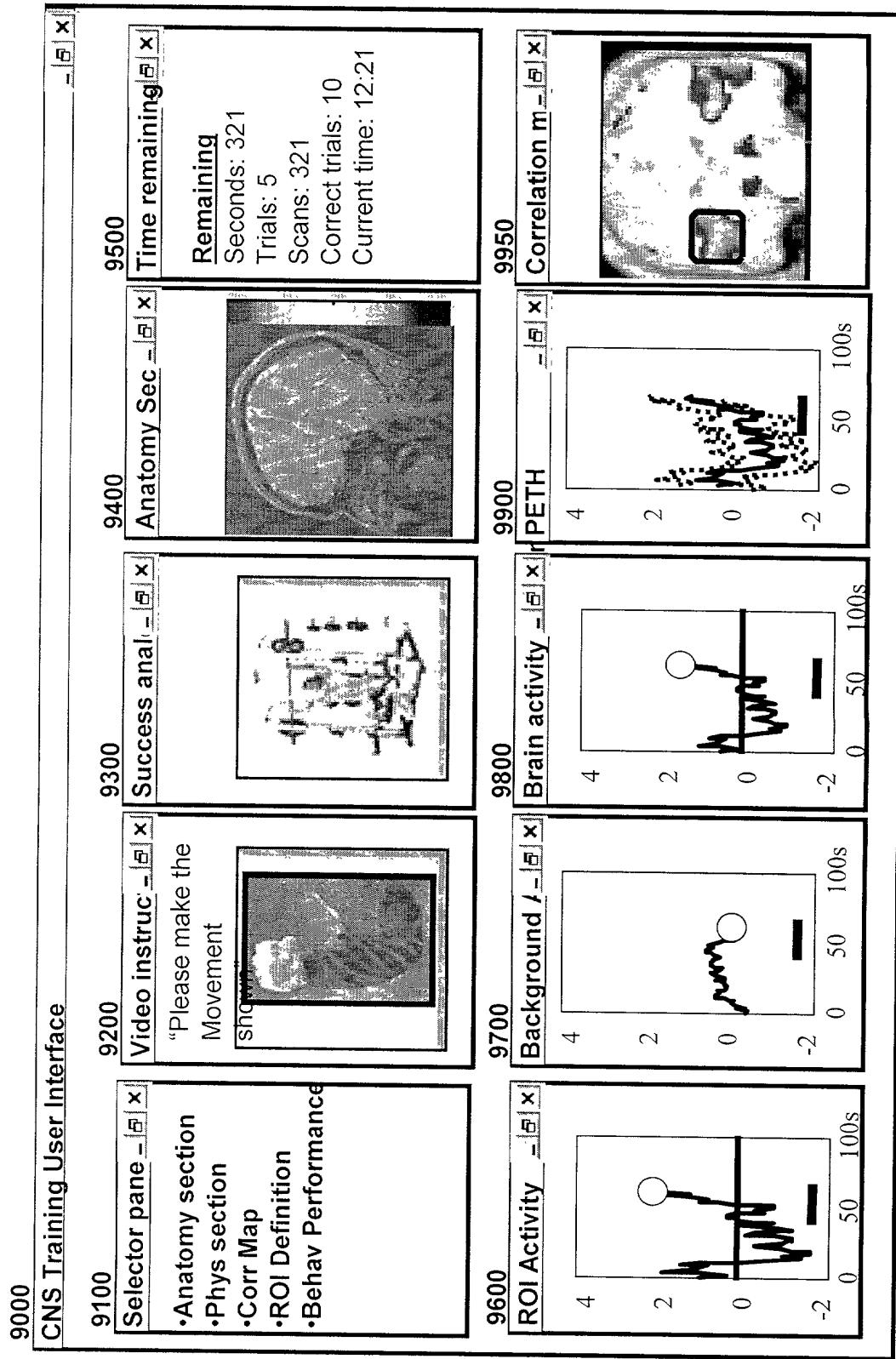


FIGURE 6

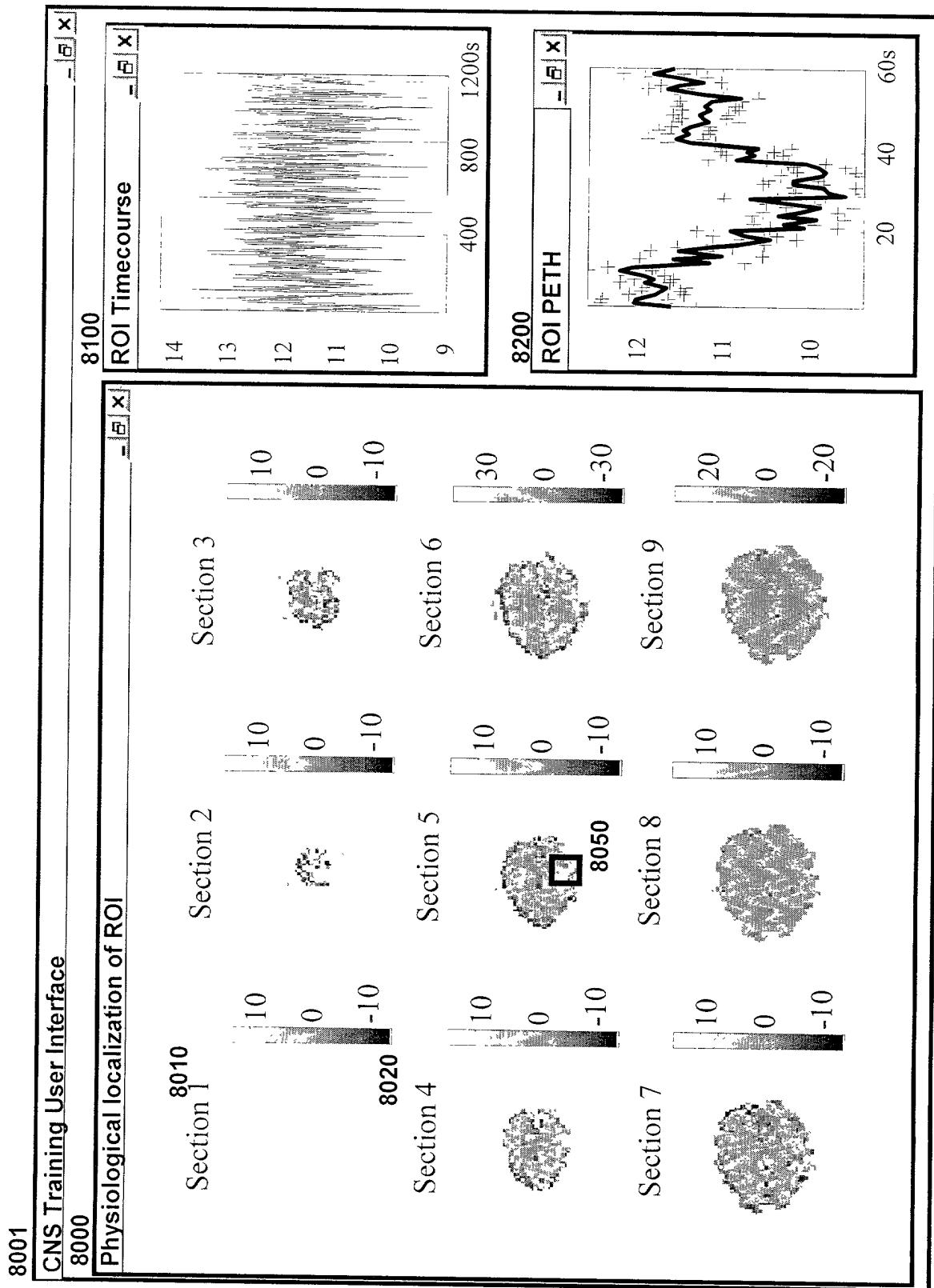


FIGURE 7

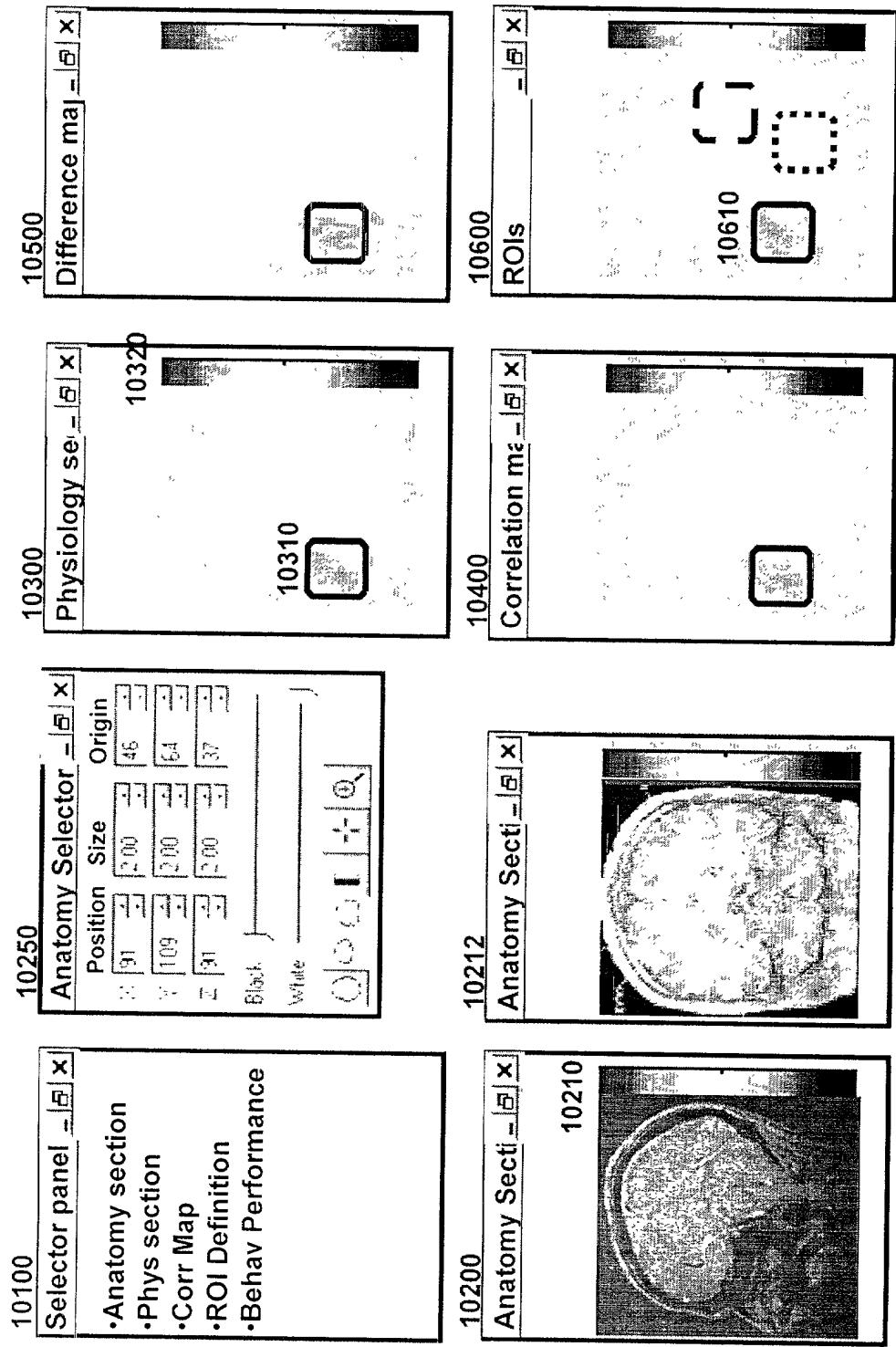


FIGURE 8

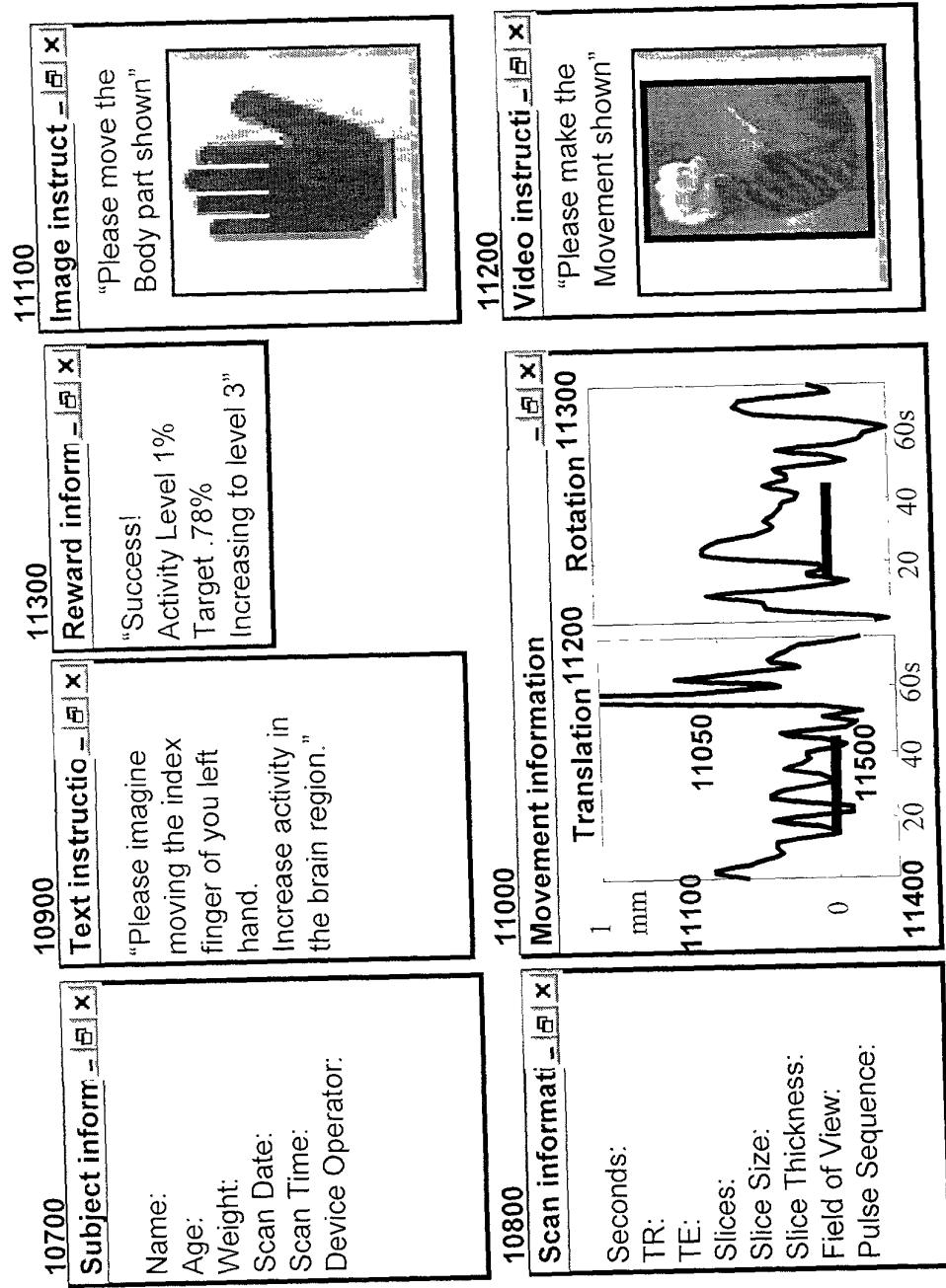


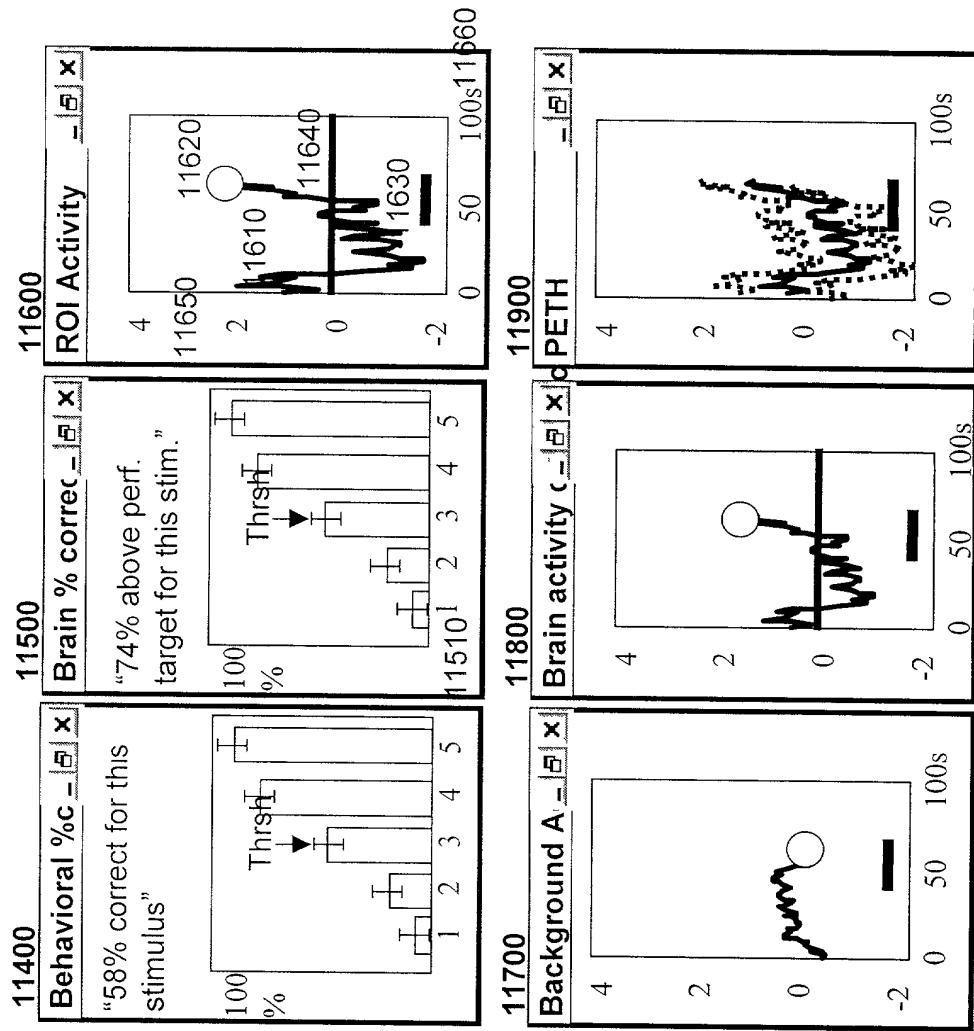
FIGURE 9

FIGURE 10

Training: repeat for # of trials

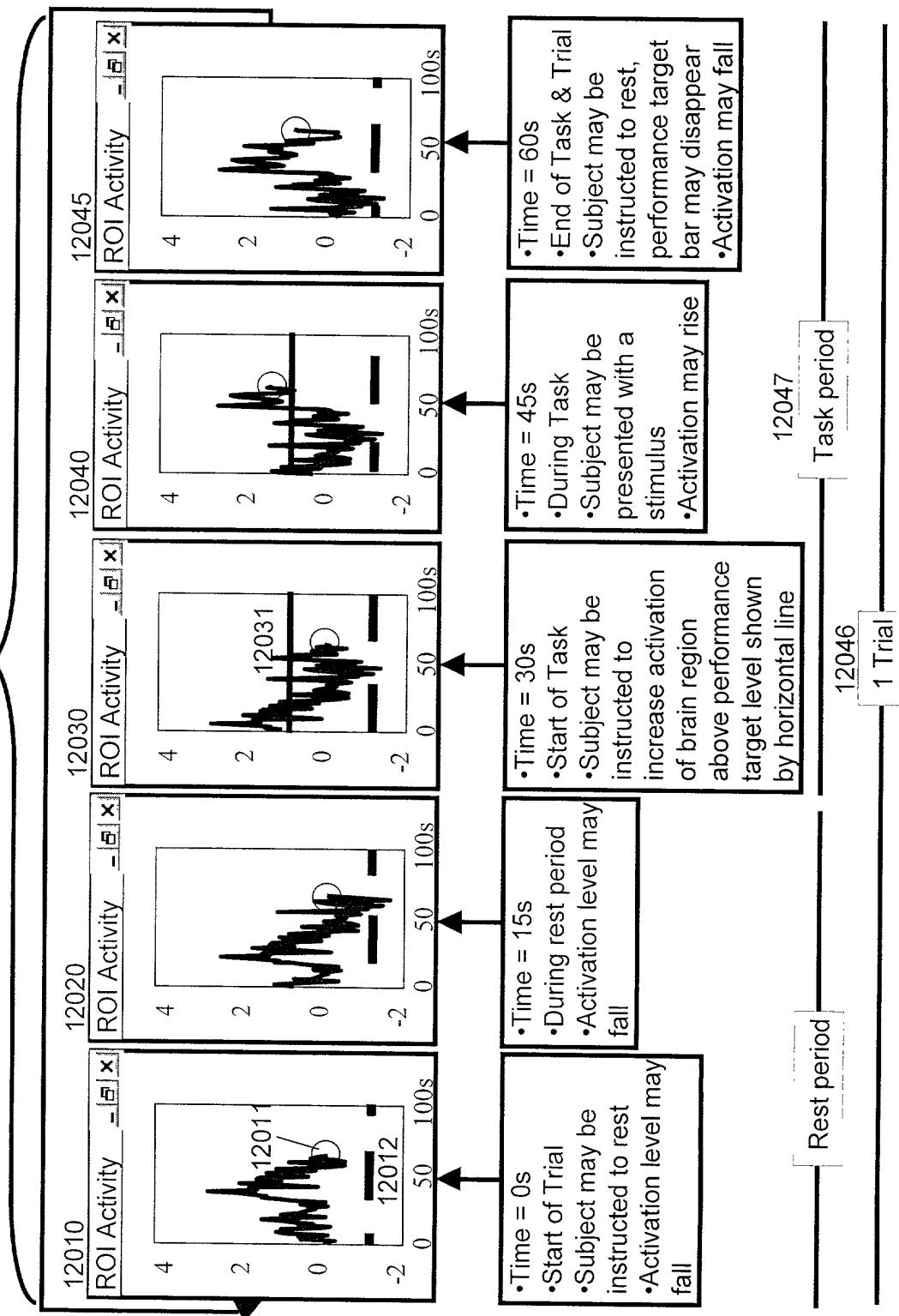


FIGURE 11

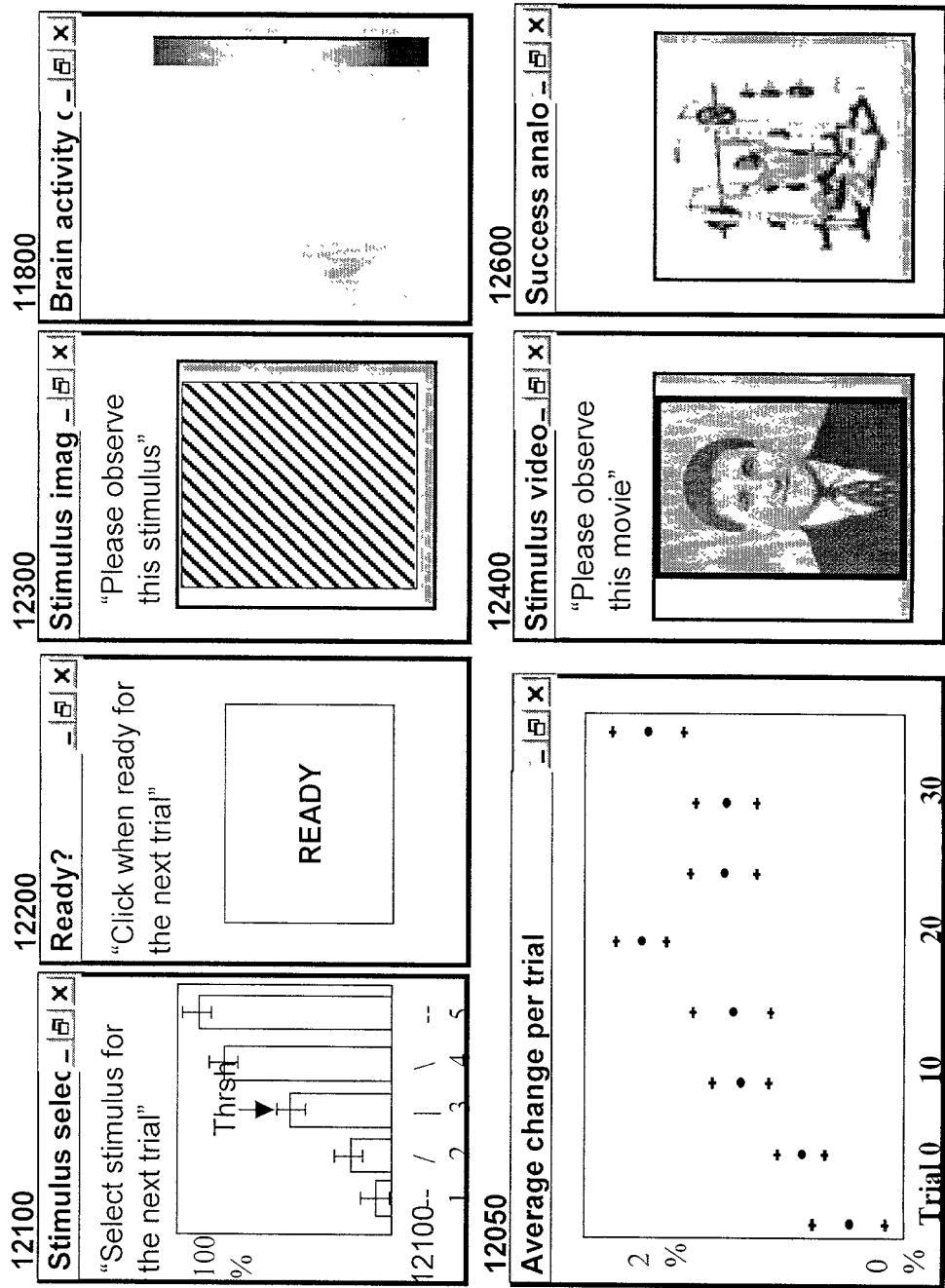


FIGURE 12

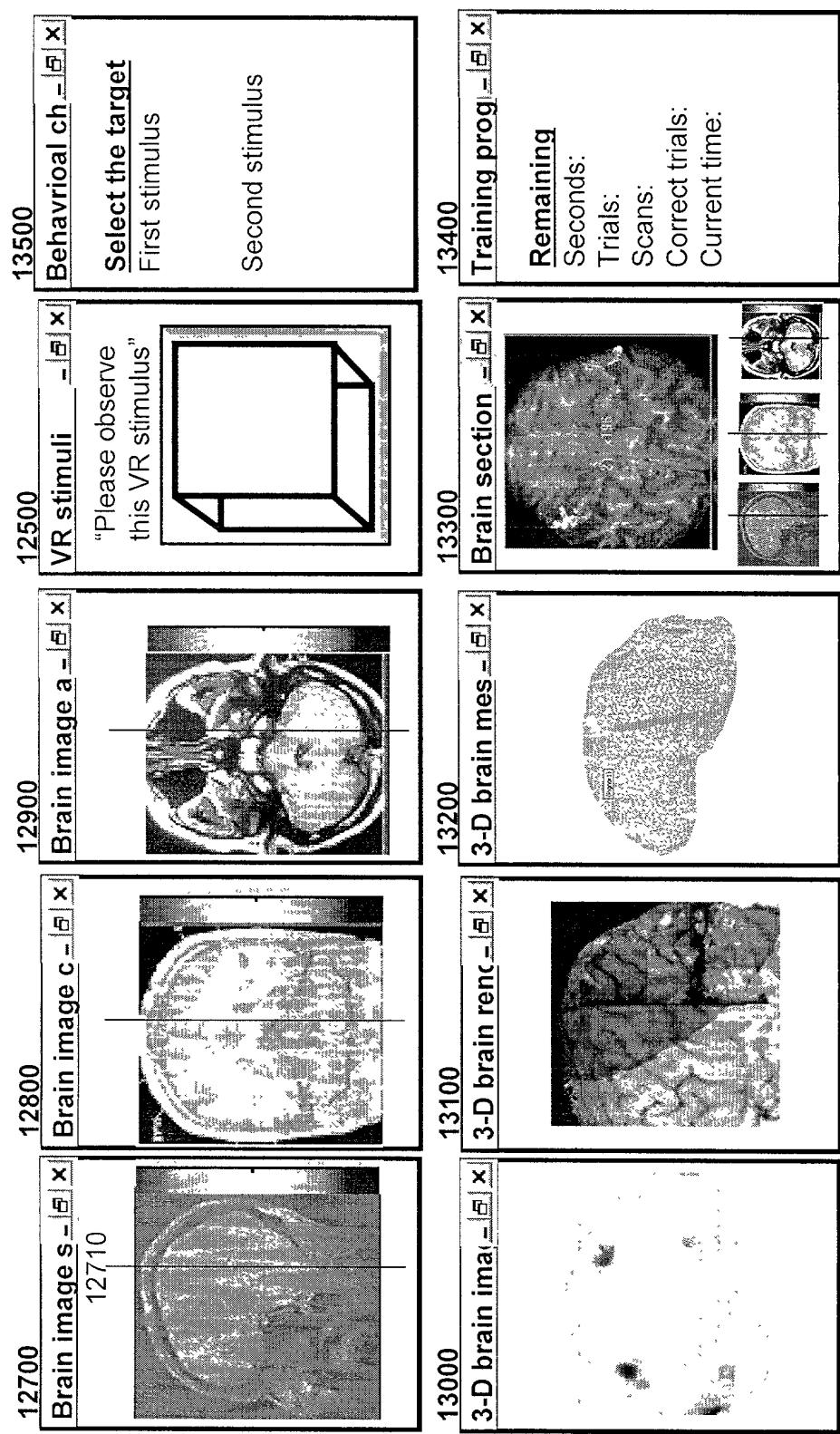


FIGURE 13

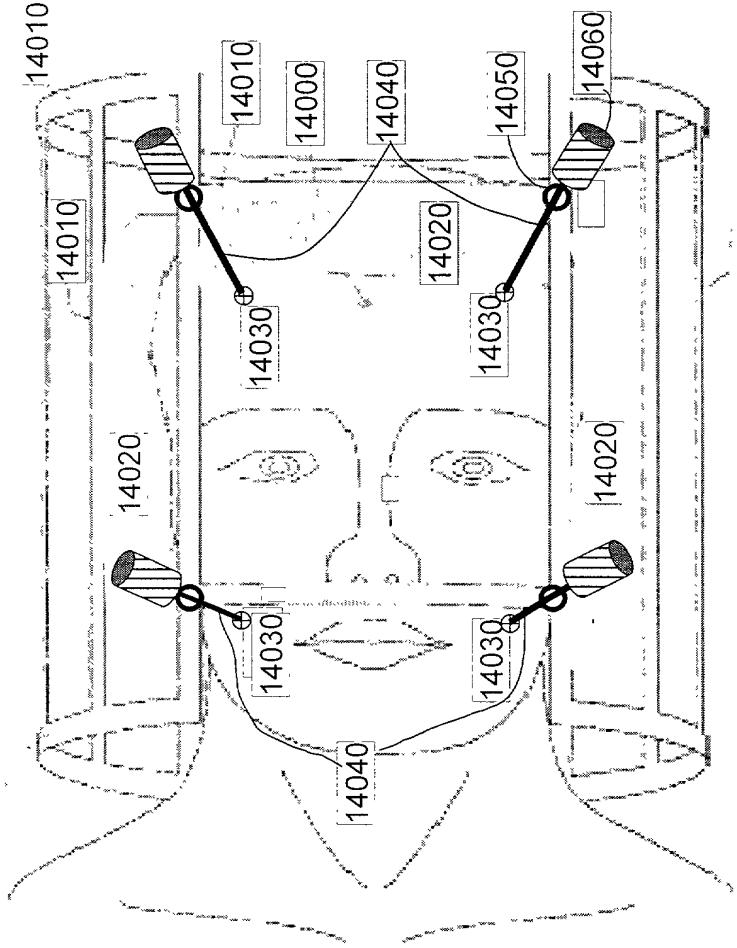


FIGURE 14

| Region | Coords. | Condition | Neuro-modulator |
|---|-------------------|---------------------------|-----------------|
| subthalamic nucleus | X=+-10 Y=-13 Z=-4 | PD | - |
| substantia nigra | X=+-10 Y=-17 Z=-8 | PD, Schz | DA |
| thalamic nucleus VA ventro anterior | X=+-10 Y=-5 Z=8 | PD | - |
| nucleus accumbens | X=+-10 Y=7 Z=-8 | SA, Rew, Schz | DA |
| thalamic nucleus VL ventrolateral | X=+-14 Y=-11 Z=8 | PD | - |
| globus pallidus internus | X=+-15 Y=-2 Z=-4 | PD | - |
| pulvinar nucleus | X=+-15 Y=-27 Z=4 | ADD | - |
| thalamic nucleus VP | X=+-17 Y=17 Z=9 | Pain | - |
| locus coeruleus | X=+-2 Y=-31 Z=-14 | ADD, SA, Rew | NA |
| globus pallidus externus | X=+-20 Y=-2 Z=-4 | PD | - |
| amygdala | X=+-22 Y=-5 Z=-12 | Pain | - |
| medial frontal lobe | X=+-3 Y=14 Z=40 | Pain | - |
| periaqueductal gray matter | X=0 Y=-26 Z=-12 | Pain | opiates |
| raphe dorsalis | X=+-2 Y=-30 Z=-12 | Pain | 5-HT |
| nucleus basalis of Meynert | X=+-4 Y=1 Z=-12 | AD, learning & plasticity | Ach |
| dorsolateral pre-frontal cortex | X=+-28 Y=34 Z=35 | Dep | - |
| anterior pre-frontal cortex | X=+-17 Y=64 Z=16 | Dep | - |
| rostral ventromedial medulla | X=2 Y=-28 Z=-28 | Pain | opiates |
| nucleus raphe magnus | X=2 Y=-30 Z=-28 | Pain | 5-HT, opiate |
| thalamic nucleus Vim ventrointeromedial | X=+-7 Y=-12 Z=4 | PD | - |
| Brodman's areas 4 | X=+-48 Y=-15 Z=40 | Motor impairments | - |
| Brodman's areas 6 | X=59 Y=-9 Z=40 | Motor impairments | - |

PD - Parkinson's disease; AD - Alzheimer's disease, ADD - attention & attention deficit/attention deficit/hyperactivity disorder, Dep - depression/mood/affect, SA - substance abuse & addiction, Schz - schizophrenia, Rew - reward
 DA - dopamine, 5-HT - serotonin, Ach - acetyl choline, NA - noradrenaline